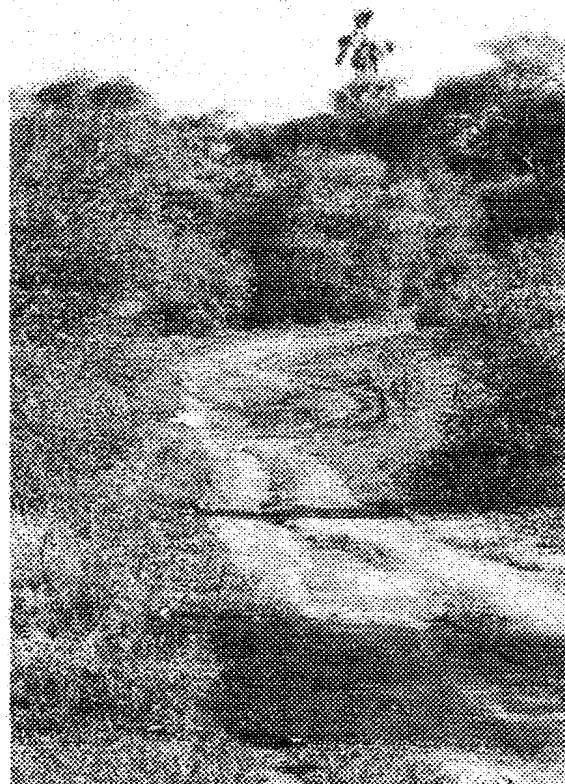
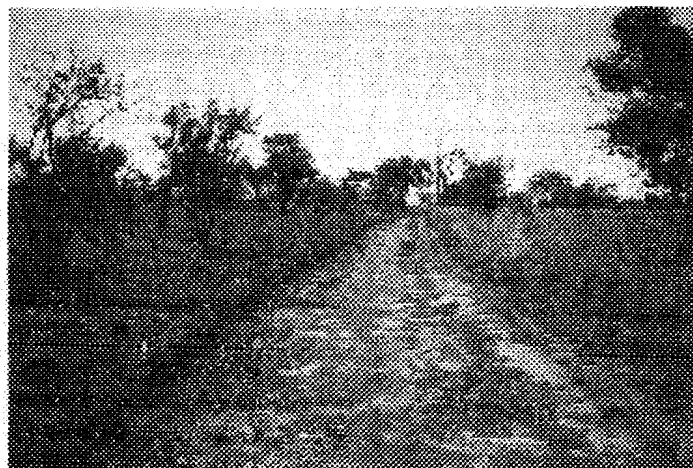


TANAPA Procedures for Environmental Reviews of Road Improvements



September 2001



Foreword

These *TANAPA Procedures for Environmental Reviews of Road Improvements* have been developed to ensure that work we undertake on our roads, both now and in the future, truly enhances the value of our parks and their special features. The *Procedures* provide a systematic way of looking at each of our road segments so as to incorporate environmentally sound design, avoid adverse impacts and prevent potentially costly mistakes. Their effective use will depend on each one of us, but especially on the dedicated field staff who day in and day out have the responsibility for conserving our parks for our nation and for the world.

They are for use by each park's Environmental Management Team under the overall direction of the Environmental Review Coordinator and the Warden in Charge. They should also be applied in conjunction with the *TANAPA Environmental Management Plan Guidelines for Road Improvements* and the *USAID/TANAPA Programmatic Environmental Assessment for Road Improvements in Tanzania National Parks*.

Comments on their appropriateness and ease of use should be submitted to my office.

A handwritten signature in black ink, appearing to read 'Lota Melamari', with a stylized flourish at the end.

Lota Melamari
Director General
Tanzania National Parks

Procedures for Environmental Reviews of TANAPA Road Improvements

This document has three parts:

Part 1 contains the *Approval Facesheet for an Environmental Review* and the *Environmental Screening and Report Form* that helps you determine what type of review is required for four categories of road improvement activities.

Part 2 provides a series of leading questions to guide *Environmental Review* preparers and describes the expected contents of any *Environmental Review*.

Part 3 includes the instructions for carrying out the *Environmental Review*. It explains, in general, the key steps and roles and responsibilities in preparing an *Environmental Review*. It is keyed to the numbered questions in Part 2. It also contains the required format for Environmental Review submissions.

Each park is responsible for the completion of an *Environmental Review* for each proposed road segment. The facesheet must be completed by the park's designated Environmental Review (ER) Coordinator for all four levels of *Environmental Review* and signed by the Park ER Coordinator, Road Manager/Road Inspector and Park Warden in Charge.

Before using this checklist and guide, quickly review all three parts to see how they are organized, as this should make it easier to use and understand this document and to follow the *Environmental Review* preparation and submission process.

**Part 1: TANAPA Approval Facesheet
for *Environmental Reviews* and the
Environmental Survey and Report
*Form***

TANAPA Approval Facesheet for Environmental Reviews

PARK _____ IDENTIFICATION NUMBER: _____ ACTIVITY NAME _____

ROAD SEGMENT LOCATION: _____

DATE ENVIRONMENTAL REVIEW (ER) RECEIVED BY WARDEN IN CHARGE: _____

DATE ENVIRONMENTAL REVIEW (ER) RECEIVED BY TANAPA PLANNING MANAGER: _____

DATE COMMENTS RETURNED TO PARK ER COORDINATOR (IF NECESSARY) _____

RECOMMENDED DECISION

____ Approved for implementation in accordance with mitigation and monitoring procedures and Best Engineering Practices (BEPs), as specified in ER.

____ Approved for Implementation with special and specific Conditions listed in Summary below.

____ Request for additional information covering subjects listed in Summary below and
 ____ detailed in attached Terms of Reference or
 ____ detailed in Terms of Reference to be sent no later than _____

SUMMARY:

Park ER Coordinator:
(Typically the Park Ecologist)

Name	Date

Park Road Manager/Inspector:

Name	Date

Park Warden in Charge:

Name	Date

TANAPA Planning Manager:
(Only for potential Level 2 and above)

Name	Date

TANAPA Director General:
(Only for potential Level 3 or 4 activities)

Name	Date

**ENVIRONMENTAL SCREENING/REPORT FORM
FOR TANAPA ROAD IMPROVEMENT ACTIVITIES**

A. Determine the Nature of the Activity:

- (1) Activity Description.** Describe in a paragraph(s), the purposes/outputs and potential environmental impacts:

B. Determine Category of Activity:

- **TANAPA Level 1 – no foreseeable adverse impact on Park resources, no further environmental review needed:**

Does the activity involve (mark yes where applicable):

- _____ Minor road repairs and standard operation and maintenance.
- _____ Provision of technical assistance, training, institutional strengthening, or research, education, awareness-building or dissemination activities. Does *not* qualify for "Level 1" if such programs include activities directly affecting the environment.
- _____ Public awareness initiatives, such as TANAPA or tour operator environmental awareness campaigns.
- _____ Technical studies and analyses and other information generation activities not involving sampling which could harm endangered species or sensitive habitats.

Do *not* mark "yes" if these involve activities directly affecting the environment.

Under Level 1, no further environmental review or action may be necessary. The Park ER Coordinator should complete the form below and ER facesheet to provide the Level 1 justification, and the Park Road Engineer/Road Inspector and the Park Warden in Charge must also approve by signing and dating the completed facesheet. However, even if the ER Coordinator finds the proposed road improvement activity falls under Level 1, he or she should still consider whether the activities may require some mitigation or monitoring to guard against possible adverse effects. The ER Coordinator should also consider steps to enhance beneficial effects and describe these as part of the Level 1 summary. Signed Level 1 ERs are forwarded to the TANAPA Planning Manager as informational copies.

- **TANAPA Level 2 – Adverse environmental impacts possible, Environmental Review required (specific conditions, including monitoring, may be applied):**

Note: The Environmental Review must address why there will be no potential adverse impacts on sensitive areas or exceptional resources, endangered or threatened species or their critical habitat; species diversity or relatively undegraded forest, i.e., justify your conclusion that the proposed Level 2 activities do not belong in Level 3 or 4. Even for activities designed to protect or restore natural resources, the potential for environmental harm exists (e.g., introduction of exotic species, effects of road improvement on the growth of strip settlement outside parks, etc.). *If you do not find an exact match for the activity you are undertaking, and it is not in Level 1, 3 or 4, then treat it as Level 2 for purposes of environmental review.*

Does the activity involve (mark yes, where applicable):

- _____ Minor construction or rehabilitation of park roads less than 10 km in length (with no change in alignment or right of way)
- _____ Ecologically sensitive areas or exceptional resources at least 200 m away from the road and not affected by construction or changes in drainage.
- _____ No relatively undegraded forest within 5 km of the road.
- _____ No significant effects on park biodiversity.

Note: These distances only provide approximate guidance. The expert judgment of the ER Coordinator and others must be applied to determine whether a road improvement impact is significant enough to require more than a Level 2 review. For example, certain exceptional resources or sensitive habitats could be significantly affected even if the road is more than 200 m from the site. Conversely, other exceptional resources can have roads approaching closer than 50 m with no adverse impacts. Also, depending on circumstance, rehabilitation of 10 km of road might in fact be very significant. For example, 10 km of road improvement in Udzungwa National Park may have far greater impact on Udzungwa's environment, than improvement of a 10 km stretch on the Serengeti plains. However, if roads pass closer to undegraded forests than 5 kms, or within 200 meters of

exceptional resources, strong justification must be provided in the Environmental Review for a Level 2 designation, outlining how impacts will be mitigated and monitored.

The same is true for consideration of road length, since under certain circumstances even a ¼ kilometer road improvement could have very significant impacts. For example, in Arusha National Park, upgrading a short stretch of road passing between two of the Momella Lakes could potentially affect the flow of underground water feeding them, and subsequently alter their ecological conditions.

(When in doubt about significance of impacts, use multidisciplinary expertise to arrive at decisions, or consult the TANAPA Planning Manager or Chief Ecologist.)

Were the following used by the TANAPA ER Coordinator in designing the above Level 2 activities (yes, no, N/A)?

- _____ *TANAPA Environmental Management Workplan for Road Improvements – Completion of Mitigation and Monitoring Status Tables*
- _____ *TANAPA Best Engineering Practices for Environmentally Sound Park Road Design and Management*
- _____ *TANAPA Programmatic Environmental Assessment for Road Improvements in Tanzanian National Parks*
- Other(s): _____

- **TANAPA Level 3 – Significant environmental impacts likely. Environmental Review required, and Environmental Assessment likely to be required:**

Does the activity involve (mark yes where applicable):

- _____ New road construction, or realignments or major upgrades of a park road over 10 km in length
- _____ Any proposed new, realigned or upgraded roads which would pass through or near sensitive ecological areas, wetlands, relatively undegraded forest lands within 5 km of the road.
- _____ Any proposed new, realigned or upgraded roads which might jeopardize threatened and endangered species or adversely modify their habitat (especially wetlands, tropical forests)
- _____ Any proposed new, realigned or upgraded roads which would pass through or near other exceptional resources closer than 200 m from the road.
- _____ Any proposed road improvement that might adversely affect park biodiversity.
- _____ Any proposed new, realigned or upgraded roads with potential to introduce exotic flora or fauna.

Level 3 activities are consistent with TANAPA criteria for activities that normally require a TANAPA Environmental Impact Assessment (EIA). In some cases determining the appropriate level is difficult and open to debate. Mark "yes" if they apply, and show in

the Environmental Review the extent and magnitude of activities and their impacts, so that TANAPA and its partners can determine if an EIA is necessary or not.

- **TANAPA Level 4 – Activities not fundable, or fundable only when specifically defined findings to avoid or mitigate the impacts are made, based on an Environmental Assessment:**

Does the activity involve (mark yes where applicable):

- _____ Road improvements determined likely to significantly degrade park resources and values, such as damage to sensitive ecological areas or exceptional resources, or introduction of exotic plants or animals.
- _____ Road improvements determined likely to jeopardize threatened and endangered species or adversely modify their habitat (especially wetlands, tropical forests).
- _____ Construction, upgrading or maintenance of roads which pass through relatively undegraded forest lands.

C. Determine Need to Prepare Environmental Review:

If all activities are in Level 1, the ER Coordinator and Road Engineer/Road Inspector and Warden In Charge sign and date the facesheet and provide a Level 1 justification. For any activities in Level 2 and 3, a full *Environmental Review* report must be prepared, assessing all of these activities' impacts. The ER is submitted to the Park Road Inspector/Road Engineer and Park Warden in Charge for approval and transmittal to the TANAPA Planning Manager. For Level 3 activities, further documentation may be required, once the TANAPA Planning Manager has confirmed the applicability of Level 3, based on the Review. The TANAPA Planning Manager will clarify whether the improvement falls in Level 2 or 3 and respond back to the ER Coordinator within 30 days of receipt of the ER. If Level 4 is possible, the ER Coordinator should consult the TANAPA Planning Manager before proceeding with the *Environmental Review*, to confirm that this is an activity that cannot be undertaken, or to explore other alternatives.

D. Prepare and Attach *Environmental Review*:

Proceed to Parts 2 and 3 for instructions on *Environmental Review* preparation.

Part 2: Guiding Questions for an *Environmental Review*

This series of questions for a guided *Environmental Review* has been designed to: a) help the TANAPA *Environmental Review* preparer know what information the review should contain; and b) place information in the hands of reviewers so that mitigative measures can be identified and/or requirements for further environmental analysis determined.

Use the *TANAPA Environmental Management Plan Guidelines for Road Improvements* and Chapter 6 from the *USAID/TANAPA Programmatic Environmental Assessment (PEA) for Road Improvements in Tanzania National Parks* to assist you in identifying possible mitigation measures.

Initial Requirements

It is assumed that standard construction specifications and inspection and monitoring procedures related to typical mitigation for TANAPA road improvements will be in place and that the *Environmental Review* need not contain all such design information. Precautionary measures associated with items such as erosion and siltation control, hydrology, proper drainage, off-road driving, protection of exceptional resources and ecological function (wetlands, forests, biodiversity, endangered species, etc.) should be specifically referenced or, if standard measures have been developed, the standard should be referenced. The objective is to identify necessary mitigation measures and link them to TANAPA EIA procedures and policies.

The *Environmental Review* is specifically designed for use by TANAPA staff to assess impacts within the protected areas comprising Tanzania's National Parks. It must therefore address in detail the potential adverse environmental impacts on protected area resources including sensitive areas, exceptional resources, wetlands, etc., and actions which might significantly degrade the park.

The *Environmental Review* must also address whether actions have the potential to introduce exotic plant or animals into the park.

The *Environmental Review* must contain information that will allow reviewers to determine if endangered or threatened species or areas of relatively undegraded forest land are present and if further investigation is required. *Relatively undegraded forest refers to the condition of a forest itself. This definition covers more than legally protected or classified forest and more than virgin forest¹.*

¹ **Relatively Undegraded Forest Definition:** Here *relatively undegraded forest* is defined as relatively intact and productive forest, i.e., trees 10 or more meters in height, usually multi-storied with closed canopy over 80%; terrestrial broadleaf forest formations not classified as "mosaic" or "secondary." It includes catchment forests and forest reserves (Tanzania Forest Ordinance Ca. 389: the main legal instrument for administration of all forests). Relatively undegraded forest "along" or "adjacent to" the road segment is determined to mean relatively undegraded forest within five kilometers on either side of the road segment. According to TANAPA's Chief Ecologist, examples might include forests in Arusha, Kilimanjaro, Rubondo Island, and Udzungwa Mountains National Parks.

Review and revision must be carried out by the designated Park ER Coordinator, in conjunction with appropriate members of the Park Environmental Management Team, including, but not limited to, the Park Roads Engineer/Road Inspector and the Warden in Charge.

If revisions are made to a previously approved ER, it must be amended and resubmitted to the TANAPA Planning Manager for approval.

Periodic training of park personnel should be provided, as appropriate, to ensure staff have both the background and understanding to carry out and prepare Environmental Reviews.

The numbered Steps in Part 2 are cross-referenced to Part 3, which describes those Steps. Part 3 also cross-references the numbered questions in Part 2.

Step 1: *Define road segment, strategic linkages and road improvement activities*

1a . General Information

Identify the Name and Location of the Road Segment (e.g., From/To, connecting x to y, in such and such an area, etc.):

Length: Current Class: Proposed Road Improvement Class:

Approximate Cost, if available: Projected Completion Date:

Equipment to be used: Personnel used:

Name other segments within same program of work or contract:

Does the road segment have independent utility? *Independent utility means that the road segment is useful in and of itself and not only as part of a larger or subsequent project. If the road segment is useful only as part of a larger project, implemented incrementally, the larger project must be identified and impacts considered collectively.*

If no, identify dependent segments and include in the Environmental Review all dependent segments.

1b. Linkages

To which other roads/trails does this road link?

Does it link to other forms of transport (air, water, or rail)? If yes, indicate how/where this linkage occurs.

What other transport alternatives were considered (air, footpath, etc.)? Briefly summarize the results of this analysis.

How does this proposed road improvement contribute to General Management Plans or Management Zone Plans or regional transport strategies? How will it affect Limits of Acceptable Use?

What is the road's economic and social impact? (Does it affect communities outside the park? To what extent will it affect park revenues?)

1c. Design Standards

Width of Roadway:	Surface:	Design Speed:
Average Travel Width:	Max Grade:	Cross Slope:
Number of Bridges:		(Show locations on map)
Number of Water Crossings:		(Show locations on map)

Will the road serve as a firebreak?

Is a wider width contemplated now or in the future? If so, for what purpose?

1d. Construction Phase Requirements

†Construction Camp Location(s)

Approximate # of Workers in Camp	Area (ha)
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†Borrow Pits or Quarries

†Spoil/Debris Disposal Locations

†Construction Staging/Laydown Locations

Will project require acquisition of additional land outside the park?

†Will detours or road closing be required during construction?

For all † items, if yes, locate where and show on map. **Note:** If cartographic maps are unavailable, well-drawn and accurate sketch maps should suffice. **If † items are not adjacent to road segment, i.e., locations and characteristics of environment are not the same, each separate location must be described, answering the same questions as in this Part 2.** For each area it is important to know if there is relatively undegraded

forest, potential impact on threatened and endangered species, or potential adverse effects on a sensitive area or exceptional resource.

Step 2: Assess direct impacts

Note: For all ♦marked questions below, the TANAPA Planning Manager may require the Environmental Coordinator or other technical specialists to carry out additional and focused environmental analysis, if potential adverse impacts appear possible. Consult the TANAPA Planning Manager and Chief Ecologist for data, maps and additional information.

2. Land Use and Park Areas

Note land use/land cover adjacent to road (within 5 km, 2.5 km on either side of centerline) and show on map.

Is there a resource use plan or other development strategy (GMP or MZP designation) for the area in which the road segment is located? What do these plans/strategies show as appropriate resource use or describe as appropriate development? How is the proposed road improvement consistent with these plans/strategies?

Name, describe and show on map existing and proposed:

- sensitive areas or exceptional resources (within 10 km, 5 km on either side of centerline)♦
- Classified or reserve forest (within 10 km, 5 km on either side of centerline)♦
- Any "relatively undegraded forest" adjacent to road♦

3. Physical Impacts

3a. Soil Erosion and Surface Runoff

How will soil erosion impacts be mitigated? Refer to PEA Chapter 6 and the *TANAPA Environmental Management Plan Guidelines for Road Improvements* Section 3. Erosion may result from grader and/or dozer operations. How will adverse effects be minimized?

Are there proposed road trail/improvements associated with slopes in excess of 10%? If so, how will erosion be controlled? How will long and/or steep gradients be minimized? What steps will be taken to follow contours?

What steps will be taken to ensure that standards for runout drains, drifts and culverts, cambering, and application of murrum will be followed?

♦Is there a parkwide quarry and murrum pit plan in place, and is it being followed? Where will the construction materials for the road improvement come from and how will potential adverse effects of mining and transportation of these materials be mitigated?

What operational steps will be taken to minimize and reverse effects of off-road driving, including cumulative effects?

Are there abandoned roads associated with this road segment? If so, what steps will be taken to decommission these roads and reduce cumulative impacts?

How will debris and spoil material be stockpiled or disposed of? How will temporary sedimentation and siltation be prevented from occurring in drainage ways, streams and water bodies?

♦Are there areas of geologic or soil instability? Are there unstable slopes, landslide or earthquake-prone areas? How will potential adverse effects be mitigated?

3b. *Bridge and drift assessment*

Does the road cross temporary or permanent rivers or streams? If yes, answer the following:

♦Has an engineering assessment and cost/benefit engineering analysis been performed to determine whether crossings should consist of drifts or bridges?

How will the long-term life of proposed stream/river crossings be guaranteed?

3c. *Drainage*

What steps will be taken to keep water off the road? How will berm effects be prevented?

Have equipment operators and laborers working on this segment been trained in proper drainage techniques? Who will ensure the work is done satisfactorily?

3d. *Hydrology, wetlands, surface water quantity and quality*

♦Does the road segment pass through major floodplains or other flood-prone locations? If yes, where possible, identify and show on map (aim to identify the 50-year flood zone). Will the project aggravate flooding or change pattern of runoff? If yes, how will effects be controlled?

Will the road improvement pass across or near wetlands? If yes, identify locations and indicate type. Will the proposed road improvement affect wetlands in any way? For example, could wetland hydrological flow be obstructed from cutting and filling or other road work? Will wetlands be filled or drained? If yes, how will effects be mitigated?

◆ Will road drainage or water control structures create wetlands or cause flooding of relatively undegraded forest? If yes, what adverse effects might occur and how might they be mitigated?

Will channelizing, culverting, impounding, or diversion of streams occur? If yes, describe aquatic resources that could be affected.

◆ If murrum application, dewatering, cut and fill, vegetation clearing, earth compaction or draining is required, what steps will be taken to maintain surface and groundwater flow, during construction and over the longer-term? Will water table height be affected? If yes, what mitigation may be needed?

How will contamination of surface water resources be controlled from fuel, oil, lubricants, or bituminous products during road construction and operation? How will adverse effects on surface water from siltation, debris and construction and operation wastes be minimized? How will siltation during construction be managed?

What steps will be taken to ensure that water used for constructing or maintaining this segment will not compete with other uses such as wildlife water supplies?

3.e Groundwater quantity and quality

◆ Is the area important as an aquifer or aquifer recharge area? Does groundwater serve as a source for vegetation, wildlife, or human water supply? If yes, will project construction require exposure or penetration of aquifer by drilling, blasting or excavation and what mitigation will be needed?

How will seepage of fuel, oil, lubricants, bituminous products be prevented from polluting groundwater during road construction and operation? How will potential degradation of groundwater from fueling and maintenance of equipment be managed and mitigated?

4. Ecological/biological impacts

4a. Habitat change, species diversity, threatened and endangered species, wildlife behavior, ecological functioning and sensitive areas

◆ Have sensitive areas of ecological significance, been identified within 10 km of the road right of way? If yes, list and identify on map.

◆ Will the proposed road improvement potentially cause changes in habitat or species diversity? If yes, describe the nature of the changes and the mitigation measures to be applied. Specifically consider issues related to LAU, management of tourist access, impacts on animal behavior, and effects of off-road driving on flora and fauna.

Do roads or trails associated with this segment pass too close to sensitive habitats or unique ecological features, for example, baobabs or kopjes? If, yes, what steps will be

taken to minimize adverse impacts? Could a trail be utilized to reach sensitive features, instead of a road?

◆Based on best available sources, list common and scientific names of endangered, threatened, rare, or endemic species of plants or animals likely to exist within 5 km of road (2.5 km on either side of centerline). Would road improvement affect any of these species or their habitat? If yes, what will be done to minimize adverse impacts?

◆Will wildlife behavior be affected by the proposed road improvement? For example, do significant wildlife migration routes cross the road and will wildlife movement or migration be interrupted by road construction, operation, or tourist visitation? Could this road segment potentially isolate animal populations? If yes, for which species? How might these effects be mitigated?

4b. Forest land and tropical forest and vegetation

◆Will road improvement work take place inside “relatively undegraded forest,” or pass within 5km of such forest on either side of the centerline? Can such a routing be avoided? If not, how will adverse impacts be mitigated? How will inappropriate siting of quarries, borrow pits and debris disposal be prevented?

What steps will be taken to ensure that road workers do not cut trees for fuelwood?

Describe vegetation and estimate total hectares of vegetation to be cleared? How will cleared vegetation be utilized and disposed off?

How will the effects of road traffic dust and mud on forests and vegetation be mitigated?

How will the potential for fires from passing vehicles be minimized?

Will this segment include work outside park boundaries? If so, what actions will be taken to reduce adverse impacts which may arise from providing improved access to land for farmers, fuelwood harvesters and charcoal makers?

4c. Exceptional resources: ecological, paleontological, archaeological, historical and cultural

◆Does the proposed segment have the potential to adversely affect exceptional resources? If yes, could this segment be rerouted away from these resources? Is trail substitution feasible?

What mitigation measures will be used to minimize adverse impacts on exceptional resources? For example, are measures in place to keep construction camps, quarries and murrum pits well away from these resources? Are there safeguards in place to ensure that buried resources encountered during construction are not destroyed or lost? Have steps

been taken to protect exceptional resources from potential vandalism, theft and accidental damage as a result of improved road access?

Based on available sources (consult with Government of Tanzania), local knowledge or observation, could the project alter any historical, archaeological or cultural heritage sites or require excavation near same? If yes, how will effects be mitigated?

4d. Exotic species

Is there significant potential for the introduction of exotic species along this road segment? How will possible introduction of exotics be mitigated?

5. Landscape impacts

5a. Scenic quality, viewshed and wilderness quality

How will the proposed road improvement affect the viewshed and wilderness quality of the area and how will adverse effects be minimized? What landscape, engineering or ecological issues may need to be addressed in selecting routing alternatives?

5b. Limits of acceptable use (LAU)/carrying capacity

Has the planning of this road improvement been integrated in an overall *Road/Trail Network Plan* for the park? If not, has full consideration been give to Limits of Acceptable use for the zone that is to receive the improvement?

6. Socio-Economic considerations

What socio-economic or socio-cultural impacts would be associated with the proposed road improvement? How can beneficial effects be enhanced and adverse impacts mitigated?

Will the road improvement change access to community facilities and services?

Will the road improvement affect development outside the park boundaries? If so, how? How can potential adverse effects be minimized (e.g., strip settlement, fuelwood harvesting, increased charcoal products)?

7. Air & noise

Will dust be a problem during construction or operation? If yes, how will dust be controlled?

Will open burning of refuse, trees and shrubs occur? If yes, how will burning be controlled?

Will blasting be required? If yes, how will noise be controlled and workers protected?

The volume of projected traffic is assumed to be too low to warrant concerns regarding the noise of vehicles and air quality impacts after a road segment is completed. However, air quality and noise should be analyzed for road improvement segments which pass close to lodges, special campsites, tented camps, and communities outside park boundaries.

8. Health

Will there be potential adverse impacts on health, such as creation of impoundments of stagnant water (by road, borrow pit, quarry)? If yes, how will disease vectors be controlled?

What actions will be taken to ensure water and sanitation standards are maintained for construction workers and construction camps?

9. Other

The questions listed above do not cover all possible types of impacts. The Environmental Review preparer is urged to consult the *TANAPA Environmental Management Guidelines for Road Improvements* and Chapter 6 of the PEA. Other sources such as the *World Bank Roads and the Environment: A Handbook*. (1997) may also be useful.

Step 3: Assess indirect and cumulative environmental impacts

This section describes indirect and cumulative impacts associated with the proposed road/trail improvement over time and how these effects might be mitigated (for example, effects on landscape, viewshed, water resources, species diversity, habitat change, wetlands, etc.).

Step 4: Summarize potential impacts on exceptional park resources, relatively undegraded forest, and threatened/endangered species

Summarize briefly the items that dealt with Threatened and Endangered Species, Sensitive Areas, Exceptional Resources and Undegraded Forest. Be certain that credible documentation is presented if direct effects on these kinds of resources are being ruled out.

Consider the potential for indirect effects and describe what monitoring may be needed.

Step 5: *Develop and complete “Environmental Management Workplan” for road improvements*

Based on the most important impacts identified by the Environmental Coordinator and the Environmental Management Team, an *Environmental Management Workplan* should be prepared, summarizing the mitigative measures that will be undertaken during planning and design, construction, operation, and decommissioning/abandonment. It should also identify who will be responsible for implementing the mitigation measures, establishing timetables and estimating costs.

The plan should also establish what workplan elements require monitoring (supervision) for followup and to ensure mitigation measures are working. It should identify the monitoring indicators to be used, determine if baseline information and data are adequate, establish how often monitoring will take place (frequency), estimate costs, and assign specific responsibility for ensuring the plan is followed.

Make recommendations concerning monitoring of sensitive locations and exceptional resources, if any, or particular environmental features or components, particularly when impacts may occur and where no mitigative measures are feasible (in other words, residual impacts that cannot be mitigated).

Step 6: *Provide additional information and complete the Facesheet*

Additional Information

- Sources:** Attach list of sources contacted to obtain data or verification of field reconnaissance observations.
- Maps:** Attach maps.
- Photos:** Optionally, attach photos considered representative of land use, any special features and the like.
- Preparer:** The *Environmental Review* preparer and Roads Manager/Inspector must identify themselves by name, title, and date, and sign the Facesheet prior to submitting it to the Chief Warden.

Part 3: TANAPA Instructions for Preparing the *Environmental Review*

1. Background

Under TANAPA Environmental Procedures, road improvements are not expected to result in adverse environmental impacts, **provided that** environmental review criteria are followed. These *Procedures for Environmental Reviews* contain the environmental criteria that must be used to plan, design, implement, and monitor activities to ensure adverse environmental impacts are minimized.

2. Purpose of Environmental Review

TANAPA under its Environmental Policies (1994) requires that environmental factors and values be integrated into its decision-making process, and that the environmental effects of its actions be assessed. Thus, TANAPA views the environmental review process as a policy requirement. However, it also regards the process as one of the best methods for incorporating the views of stakeholders, and for guaranteeing that environmental aspects are considered and integrated into all phases of park development and management.

Besides specific environmental procedures with which TANAPA must comply to minimize adverse environmental effects, a park may not undertake the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands, *unless* a formal EIA is conducted that shows the activity will contribute significantly and directly to improving the livelihoods of the rural poor and is conducted in a manner that supports sustainable development. Similarly, when actions may jeopardize a threatened or endangered species or adversely modify its habitat, a formal EIA must be prepared. If activities have the potential to significantly degrade a park or introduce exotic plants or animals, the construction, upgrading or maintenance of the road in question cannot be undertaken.

3. Roles and Responsibilities

Use of these environmental criteria constitutes the "*Environmental Review*" (ER) of the activity (road improvement). Each road segment or group thereof will require an ER. The report will be prepared by the designated Park ER Coordinator with the approval of the Park Road Manager/Road Inspector, and submitted to the Warden in Charge (WIC) for his or her approval. Once approved by the WIC, the ER Coordinator then forwards the ER to the TANAPA Planning Manager for review. Based on the assessment of the ER by the TANAPA Planning Manager, approval may be given, or additional analysis and documentation may be required.

The Warden in Charge is ultimately responsible for making certain that ERs are carried out as necessary, and that TANAPA's Planning Manager receives the report. The Park ER Coordinator should ensure that all those responsible for, and involved in, road improvements, have the chance to participate in ERs. The TANAPA Planning Manager will be responsible for providing technical specialist(s) or consultants, as needed, to prepare the ERs.

The Environmental Management Team is responsible for addressing all potentially adverse environmental concerns (also includes encompassing economic and socio-cultural effects). Others involved will address engineering issues, funding, employment considerations, etc. But the Environmental Management Team and ER Coordinator are specifically charged with the responsibility for the park's environmental stewardship.

4. Timing and Level of Effort

These criteria are designed to be used at all stages of the project. The ER is a process involving field observation and discussions with park staff, technical experts, tour operators, visitors and local people who are affected by park roads. The ERs will document that process, analyze the results, and outline practical mitigation steps.

The ER should be initiated while a road improvement is being planned. Planning and design information will be necessary to complete certain portions of the ER, since it is at the planning stage that environmental impacts can be avoided or diminished most easily.

The level of effort for an ER should be established based on the expected extent and significance of environmental impacts. The ER Coordinator and Environmental Management Team should use informed judgment to decide on the level of effort necessary for each ER.

5. Use of Environmental Review Criteria

These environmental review criteria do not purport to contain the full range of environmental impacts that may result from road improvements; nor do they contain all possible questions regarding road improvement activities and their effect on the environment. They provide a framework to guide the ER Coordinator and, as questions and issues become apparent, they should be included in the ER. The ER should be viewed as a learning process for all involved, so that future ERs will have the benefit of experience. Any information deemed useful should be appended to these criteria.

These criteria should not be treated as a technical design guide. Technical design aspects are in the Road Engineer's realm. The ER Coordinator will no doubt use the Road Engineer's expertise to assist in conducting the ER, and may develop a mitigation measure that will require the Road Engineer to modify his design or that will require engineers to design it.

In addition to assessing adverse impacts, the ER Coordinator should document where the road improvement activities are having a beneficial effect, and suggest possible steps to further increase benefits.

Direct impacts occur on or along a road. They may be a direct result of constructing or improving it. They may also occur from vehicles operating on it after work has been completed. Use PEA Chapter 6, which provides many examples of direct impacts related to construction and operation of park roads.

Indirect (also called induced) impacts occur as a result of the influence a road improvement can have on overall change, removed in space and time from the road itself -- to park resources, environmental features, exceptional resources or stakeholders. Indirect impacts are difficult to predict. They do not necessarily become obvious at the time of the road improvement, and sometimes they are difficult to link to the improvement itself or to operation and maintenance. Therefore, it is critical that the ER Coordinator understand all forces acting upon the environment in the project area so that a reasonable prediction of indirect impacts can be made. Examples include changes in: extent of forest cover; wetland ecology; other changes in vegetation or wildlife; effects on exceptional resources; water availability (quality and quantity); socio-cultural characteristics of affected stakeholders, including communities outside the park, the tourist industry and visitors; economic costs and benefits, and the like. PEA Chapter 6 also provides examples of induced or indirect impacts for a host of environmental components.

6. Steps for Environmental Review

Part 2 contains a series of guided questions dealing with each of the steps listed below. This section and Part 2 are keyed by number to each other.

Step 1: Define road segment, strategic linkages and road improvement activities (Part 2 Items 1a through 1d)

Use a map to have the park Road Engineer or Inspector define the road segment under consideration (location, length, type of road); and review the construction/engineering plan to determine the specific actions involved, including the need for water crossings, construction camp, lay down area and off-site borrow areas or quarries. Cartographic maps should be used whenever feasible, but well-drawn, accurate sketch maps may be used if other maps cannot be obtained.

The ER Coordinator with the park Road Engineer/Inspector should review the objective of the road improvement -- to improve access from where to where? Improve access for whom? Is the selected segment the most rational choice to fulfill the purpose, or is there another possible choice? For example, could a trail be substituted for all or a portion of the segment under consideration? If there are other possible routes that will accomplish the same objectives, document them, since later it may become necessary, due to the degree of environmental impacts along the chosen route, to search for alternative routes.

To evaluate direct impacts along a road segment in Step 2, the ER Coordinator should have a clear picture of the exact actions that will take place: plans and design standards to be applied to new road construction; for road rehabilitation the nature of repairs, e.g., are these directly on the road or repair to culverts/drainage systems beneath the road; construction of passing areas along the road; road widening; mining material from borrow pits; or, perhaps, road realignments.

In addition, the ER Coordinator must obtain information on the type of construction -- mechanical and/or manual -- that will be used to undertake road improvements. Each type of construction method has a different set of associated environmental concerns.

Step 2: *Assess direct environmental impacts (Part 2 Items 2 through 9)*

The ER Coordinator must go to the location (including borrow pits or other locations such as construction camp sites or laydown areas) of each action, and evaluate the effect of the action on the environment. In addition, he/she should look at each discrete action, at the road segment as a whole, and also imagine the road improvement process along the entire road segment. Use PEA Chapter 6 as a guide in identifying possible direct impacts.

Rating the importance of the affected component of the environment:

The ER Coordinator may wish to talk to other park staff and local residents to determine the importance of the environmental components that will be affected, and should consult with the TANAPA Planning Manager for relevant sources of information for classified forests, parks and presence of endangered or threatened species.

When resources are considered important and impacts must be minimized, and there are no alternatives to improving the segment without direct impacts, best engineering practices (BEPs) should be implemented (see *Best Engineering Practices for TANAPA Road Improvements*). Although BEPs are standard practices, the ER Coordinator needs to document the areas of concern and the BEPs that should be implemented to ensure adverse effects are minimized. This information must be included in the ER.

There may be potential impacts that cannot be mitigated using the BEPs (residual impacts). In this case, the ER Coordinator may develop or design other BEPs/mitigation measures. Or if the ER Coordinator determines that a resource is important, but is unable to design any BEP/mitigation measures to protect it, the ER Coordinator will need to bring this to the attention of the TANAPA Planning Manager and request assistance. The particular action affecting the resource of importance may need to be deleted from the design plans; or an alternative route may need to be chosen, and an ER conducted on it.

Step 2 involves preparation of documentation -- a map and narrative -- of the specific areas and activities of concern, and the BEPs or other mitigative measures.

Step 3: *Assess indirect and cumulative environmental impacts*

The ER Coordinator must next evaluate the potential for indirect impacts. This will involve discussions with local people, review of land use maps and an understanding of the trends and changes that would occur without the road improvement (the no action alternative) as well as with it. This is where the ER Coordinator will need to be especially thoughtful and creative because there are no standard procedures for predicting indirect effects, nor standard practices for minimizing them.

To assess indirect impacts, the ER Coordinator should have a clear picture of the park and surrounding communities and region: Who will the road improvement benefit? What areas, if any, will the road segment make accessible that were previously inaccessible?

If a road segment is constructed or maintained outside the park, describe the social and economic impacts the road is expected to have, e.g., more employment, effects on local economies, strip settlement, more access to land for agricultural use or fuelwood harvesting and charcoal production. Include costs and benefits of particular or unusual nature. For adverse impacts, describe mitigation measures. Consider what changes in land use, population, community structure, forest cover and the like could occur. Will the proposed road have an adverse or beneficial effect on poaching?

The guiding questions for this *Environmental Review* represent an effort to help Environmental Review preparers focus on the most significant impacts observed by the PEA Team during PEA field observations. However, the impacts of significance will vary from park to park, and so the guiding questions are far from being all-inclusive.

Some of the potential long-range outcomes may be beneficial to the environment; some may be adverse. If adverse outcomes are predicted, mitigative actions should be identified to offset the adverse effects. Chapter 6 of the PEA should be used as a guide to help identify potential indirect and cumulative impacts.

In summary, what changes will the road improvement bring over a five-year period or more? How will the affected area look in twenty years?

**Step 4: *Summary of potential impacts on exceptional park resources, relatively undegraded forest, threatened/endangered species, and biodiversity*
(Special Attention to Part 2 Items marked with the † symbol)**

The absence of relatively undegraded forest needs to be confirmed based on reliable ecological observations and documentation. If the ER Coordinator determines that relatively undegraded forest may be present along the road, the ER must contain this information and he or she must alert the TANAPA Planning Manager. Further ecological studies may be needed to make the final confirmation: if confirmed, a full EIA may be needed prior to construction; or the road segment under construction may need to be deleted or deferred from road improvement plans.

The ER Coordinator must confirm the absence of threatened or endangered species (TES) by coordinating with the TANAPA Planning Manager. The ER Coordinator may find the most effective means of confirming the presence and effect on TES is to coordinate with an environmental NGO. If activities may affect TES, follow the same procedures outlined above.

The ER Coordinator must also bring to the attention of the Planning Manager potential adverse environmental impacts to biodiversity or exceptional park resources, and use the same procedure outlined for relating undegraded forest and TES.

Step 5: *Develop and complete the “Environmental Management Workplan”*

Following the steps above, the ER identifies park resources of importance, possible actions that could affect those resources, and BEPs that will protect them. Practical mitigation measures are been identified to minimize adverse impacts. Other impacts have been identified which may provide long-range benefits to the environment.

Depending on the number and importance of any impacts and the need for specialized monitoring, the ER Coordinator with the Environmental Management Team, including the Park Road Manager/Road Inspector, develop an *Environmental Management Workplan* for road improvements. To develop the *Environmental Management Workplan* for the road segment under consideration use the *TANAPA Environmental Management Plan Guidelines for Road Improvement*, and complete the Mitigation and Monitoring Status Report Forms provided in Section 5 of the *Guidelines*. The *Workplan* and Status Report Forms are to be submitted each year as part of the annual budget preparation process for park road works.

Step 6: *Complete the Facesheet and provide additional information*

Completing the Facesheet is fairly self-explanatory. The identification number is simply for internal park purposes as a quick reference guide for future correspondence or follow-up analyses. The recommended decision is initially made at the park level and signed first by the Park ER Coordinator and the Park Road Manager/Inspector. The ER is then approved by the Park Warden in Charge before being forwarded on to the TANAPA Planning Manager. However, it is permissible to share unsigned drafts of the ER with the Planning Manager as long as they are clearly marked **DRAFT**.

Proposed road improvements which fall under Level 1 do not require approvals beyond the Park Warden in Charge, although an informational copy is provided to the TANAPA Planning Manager. Activities classified as Level 2 require review and approval by the Planning Manager. Level 3 activities also require approval from the TANAPA Director General and trigger a TANAPA environmental assessment. Proposed improvements which may fall under Level 4 require review by both the Planning Manager and the Director General.

Within 30 days from the date of the park's submission of the ER to the TANAPA Planning Manager, the Planning Manager must respond back to the Park Warden in Charge, either approving the ER as submitted; approving with additional conditions; requesting additional information or analyses be conducted; or by deferring or deleting the proposed road improvement activity. All such actions require prior consultation with the Environmental Management Team, which includes the Park Warden in Charge.

For Tarangire and Lake Manyara National Parks, an additional review requirement calls for approval of all activities categorized above Level 1 by the USAID Mission Environmental Officer, because of USAID Environmental Regulations governing the use of USAID funds for road infrastructure work being funded by USAID in these two parks. The specifics of the USAID approval process has been provided separately to the TANAPA Planning Manager at Headquarters and to the Warden in Charge at Tarangire and Lake Manyara.

Step 7: *Present, discuss and obtain approvals*

The following format should be used for the *Environmental Review* submission:

Facesheet

- Section 1: Environmental Screening/Report Form for TANAPA Road Improvements.
- Section 2: Definition of Road Segment, Strategic Linkages and Road Improvement Activities
- Section 3: Assessment of Direct Impacts
- Section 4: Assessment of Indirect and Cumulative Impacts
- Section 5: Summary of Potential Impacts on Exceptional Park Resources, Undegraded Forest, Threatened/Endangered Species and Biodiversity
- Section 6: *Environmental Management Workplan* for proposed road improvement
- Section 7: Additional Information

Prior to finalizing the ER, the ER Coordinator should present the findings to the Warden in Charge, other Park planning personnel including key road works staff, staff with ecological responsibilities, and technical assistance contractors, where appropriate. All ERs should be signed by the responsible parties and a completed copy forwarded to the TANAPA Planning Manager for approval. Final approval of ERs with proposed Level 3 or 4 activities also requires the signature of the TANAPA Director General.

Be prepared to discuss any recommended mitigation measures or BEPs. Make sure those responsible for final design understand what is required regarding BEPs/mitigation

measures. Incorporate relevant comments into the ER. Determine who will be responsible for conducting compliance checks and documenting the results in reports to the Warden in Charge.

The ER should also include maps showing the location of the road segment under consideration and areas/actions of concern. These should be of good cartographic quality, but when this is not possible, accurate sketch maps should suffice. Copies of any other maps that were used to make determinations/assumptions should also be included. The following are suggested:

- Location maps (Big picture);
- Sketch route with actions and resources of concern; and
- Narrative referenced to maps, presenting all information requested in Annex B.2.

In summary, the ER must be submitted to the TANAPA Planning Manager for approval prior to construction or implementation of the road improvement. Allow sufficient time between submitting the ER and any plans for construction for this evaluation and approval process.

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